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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

LEE, EUGENE

ART UNIT PAPER NUMBER

2815

DATE MAILED: 12/11/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/862,982

Applicant(s)

AMMAR, DAN F.

Examiner

Eugene Lee

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AW

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 17 September 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-15 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-15 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 5/22/01 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 13) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.
a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ 6) ☐ Other: _____

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DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 8/22/03 has been entered.

Drawings

2. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the "on a board without intermediate leads" must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

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4. Claims 1 thru 15 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

The limitation "on a board without intermediate leads" is not described in the specification. Regarding claim 1, the specification does not disclose the MMIC package being placed on a board without intermediate leads.

5. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1 thru 15 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

It is not clear what the applicant is referring to in the limitation "on a board without intermediate leads." The Examiner is unclear whether the base plate 44 is the board or whether the entire MMIC package is placed on an exterior circuit board. For the sake of compact prosecution, the Examiner has interpreted the MMIC package being placed on an exterior circuit board, however, appropriate clarification and correction are required.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Insofar as definite, claims 1 thru 3, and 6 thru 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ziegner et al. '286 in view of Koizumi et al. '927 in view of Goto et al. '074, and further in view of Martin 5,610,431. Ziegner discloses (see, for example, FIG. 11) a packaged integrated circuit (microwave integrated circuit (MMIC) package) comprising a millimeter wave circuit (MMIC) 32a, base (base plate) 22a, and cover (chip cover) 24a. The end portions of the base plate and cover engage with each other to form the total housing. In column 3, lines 51-56, Ziegner discloses that the base and integrated circuit are substantially thermally matched. Ziegner does not disclose a solder preform contained on the base plate, said MMIC being mounted on the solder perform. However, Koizumi discloses (see, for example, Fig. 2) a high-frequency device package comprising MIC 1 mounted on a base 2 by way of solder. See, for example, column 3, lines 23-25. Therefore it would have been obvious to use a solder perform in Ziegner's invention in order to stably attach the base to the millimeter wave circuit.

Ziegner in view of Koizumi does not disclose a microwave monolithic integrated circuit package wherein any pads on said MMIC are exposed for wire and ribbon bonding thereto. However, Goto discloses (see, for example, FIG. 9) a microwave semiconductor device comprising a GaAs substrate (chip) and lid (cover) 40f. The lid has through holes 40h which expose the GaAs substrate and permit waveguides 12a, 12h to connect to the GaAs substrate

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externally. Therefore it would have been obvious to one of ordinary skill in the art at the time of invention to put holes in the cover of Ziegner in view of Koizumi and expose the MMIC for wire and ribbon bonding thereto in order to connect the chip externally to other devices.

Ziegner in view of Koizumi in view of Goto does not disclose the wire and ribbon bonding on a board without intermediate leads. However, Martin discloses a chip (MMIC) 36 that is bonded to a circuit board 70. The bonding is done through wires 82 that extend from chip pads 68 to the circuit board (without any intermediate leads). Such an arrangement produces a more robust semiconductor device in which a chip can interact with a circuit board. Therefore it would have been obvious to one of ordinary skill in the art at the time of invention to bond the packaged integrated circuit of Ziegner in view of Koizumi in view of Goto to a circuit board without any intermediate leads in order to produce a more robust semiconductor device that contains a chip on a circuit board.

Regarding claim 2, see, for example, column 3, lines 47-48 of Ziegner.

Regarding claims 3 and 12, Ziegner in view of Koizumi in view of Goto in view of Martin discloses the claimed invention except for said base plate being about 10 to about 15 mil thick. However, it would have been obvious to one of ordinary skill in the art at the time of invention was made to use this range, since such a thickness would capably support a chip and it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or working ranges involves only routine skill in the art. In re Aller, 105 USPQ 233.

Regarding claims 6 and 13, Ziegner in view of Koizumi in view of Goto in view of Martin discloses the claimed invention except for the solder preform being about 1 to 2 mil thick.

It would have been obvious to one of ordinary skill in the art at the time of invention was made to use this range, since such a thickness would capable connect the chip to the base and it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or working ranges involves only routine skill in the art. In re Aller, 105 USPQ 233.

8. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ziegner '286 in view of Koizumi '927 in view of Goto '074 in view of Martin '431 as applied to claims 1 thru 3, and 6 thru 15 above, and further in view of Harris et al. '171. Ziegner in view of Koizumi in view of Goto in view of Martin does not disclose the chip cover being made of plastic.

However, Harris discloses a semiconductor package comprising a die 110, base 102 and lid (cover) 104. The lid is made of plastic and protects the die from the environment. See, for example, column 2, lines 56-58. Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention was made to use plastic for the cover in order to reliably protect the chip from the environment.

9. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ziegner '286 in view of Koizumi '927 in view of Goto '074 in view of Martin '431 as applied to claims 1 thru 3, and 6 thru 15 above, and further in view of Hayakawa '754. Ziegner in view of Koizumi in view of Goto in view of Martin does not disclose said solder perform being formed from a gold-tin alloy. However, Hayakawa discloses (see, for example, FIG. 2) a high-frequency semiconductor device comprising chips 41, 42, and base 1. The chips are attached to the base by a Au-Sn solder. See, for example, column 3, lines 3-5. Therefore, it would have been obvious to one of

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ordinary skill in the art at the time of invention was made to use a gold-tin alloy in order to a reliably attach a chip to a base.

Response to Arguments

10. Applicant's arguments with respect to claims 1-15 have been considered but are moot in view of the new ground(s) of rejection.


INFORMATION ON HOW TO CONTACT THE USPTO

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Eugene Lee whose telephone number is 703-305-5695. The examiner can normally be reached on M-F 8-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Eddie C. Lee can be reached on 703-308-1690. The fax phone numbers for the organization where this application or proceeding is assigned are 703-308-7722 for regular communications and 703-308-7722 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.

Eugene Lee
December 9, 2003


GEORGE ECKERT
PRIMARY EXAMINER